भारतीय मानक
Indian Standard

IS 2427 : 2022

वस्त्रादि — सतत तंतु विस्कोस रेयॉन धागे एवं एसीटेट धागे, चमकदार और चमकहीन — श्रेणीकरण

(दूसरा पुनरीक्षण)

Textiles — Continuous Filament Viscose Rayon Yarn and Acetate Yarn, Bright and Dull — Grading

(Second Revision)

ICS 59.080.20

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Man-Made Fibres, Cotton and Their Products Sectional Committee, TXD 31

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by Man-Made Fibres, Cotton and Their Products Sectional Committee had been approved by the Textile Division Council.

This standard was first published in 1963 and subsequently revised in 1968. It has been revised again to align it with latest manufacturing and trade practices commonly followed in the country in this field.

With the increase in the use of continuous filament viscose rayon yarn and acetate yarn in different sectors of the weaving industry, the demand for various grades of such yarns has arisen. This standard was, therefore, initially prepared with the intention of clearly defining the various grades of continuous filament viscose rayon yarn and acetate yarn and thereby eliminating the ambiguity and confusion arising from the interpretation of the grades. It is hoped that this standard would enable the buyer to select the correct grade of yarn for a particular requirement.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILES — CONTINUOUS FILAMENT VISCOSE RAYON YARN AND ACETATE YARN, BRIGHT AND DULL — GRADING

(Second Revision)

1 SCOPE

This standard prescribes a method of grading continuous filament viscose rayon yarn and acetate yarn, bright and dull, wound on packages. This standard is applicable only to single yarns of viscose and acetate rayon.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 TERMS AND DEFINITIONS

For the purposes of this standard, the terms and definitions given in IS 232 and IS 1324 shall apply.

4 GENERAL REQUIREMENTS

The material shall be examined for its appearance (colour), black specks, formation, cross ends and loops, milkiness and dyeing characteristics.

5 SPECIFIC REQUIREMENTS

5.1 The material shall be tested for its commercial weight, tex (or denier), tenacity, number of filaments, number of knots, broken filaments, sulphur content and turns per metre.

5.1.1 *Commercial Weight* — The commercial weight of the material shall be determined by the method prescribed in IS 7703 (Part 3).

5.1.2 *Tex* (*or Denier*) — The count of the material in tex (or denier) shall be determined by the method prescribed in IS 7703 (Part 1).

5.1.3 *Tenacity* — The single strand tenacity (dry) of the material shall be determined by the method prescribed in IS 7703 (Part 2).

5.1.4 *Filaments* — The number of filaments in the material shall be determined by any suitable method. A common method is outlined in **B-1**.

5.1.5 *Number of Knots* — The number of knots in the material shall be counted.

5.1.6 *Broken Filaments* — The number of broken filaments in the material shall be counted.

5.1.7 *Dyeing Characteristics* — If required, the material shall be dyed by a commercially satisfactory method and the dyed yarn examined visually for the evenness of dyeing.

5.1.8 *Sulphur Content* — The sulphur content of the material shall be determined by the method given in **B-2**.

5.1.9 *Turns per Metre* — The turns per metre value of the material shall be determined by the method prescribed in IS 832 (Part 1).

6 GRADING

6.1 The viscose rayon yarn and acetate yarn shall be graded for each of the various characteristics applicable to the type of package being tested as given in the appropriate Tables 1 to 5 in accordance with **9.4**.

6.2 The lot shall be classified to be of that grade which corresponds to the lowest one out of the grades determined for individual characteristics.

Table 1 Classification of Yarn in Cones

(*Clause* 6.1 *and* 9.4.2)

Sl No.	**Characteristic**	**Grade**		
		1	**2**	**3**
(1)	(2)	(3)	(4)	(5)
i)	Tolerance for commercial mass of the lot, percentage of the mass specified by the manufacturer	Up to ± 5	± 5 to 10	± 10 to 15
ii)	Appearance (colour)[1]	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Number of knots on the face of the cone:			
		Not more than	*Not more than*	*Not more than*
	a) Viscose rayon yarn (kg/cone)			
	30 d (0.7)	20	25	30
	40 d (1.0)	20	22	28
	60 d (1.0)	12	16	21
	75 d (2.0)	20	28	36
	100 d (2.0)	16	23	30
	120 d (2.0)	14	21	27
	150 d (2.0)	12	18	24
	300 d and above (2.0)	8	13	18
	b) Acetate yarn (kg/cone)			
	75 d (1.25)	10	15	22
	100 d (1.25)	10	15	22
	120 d (1.5)	12	18	26
	150 d (1.5)	12	18	26
	300 d and above (1.5)	12	18	26
iv)	Broken filaments at places on single surface:			
	a) Viscose rayon yarn (kg/cone)			
		Not more than	*Not more than*	*More than but not fizzy*
	30 d (0.7)	10	26	26
	40 d (1.0)	10	26	26
	60 d (1.0)	8	18	18
	75 d (2.0)	12	29	29
	100 d (2.0)	9	22	22
	120 d (2.0)	8	18	18
	150 d and above (2.0)	6	15	15
	b) Acetate yarn, all denier	4	11	12
v)	Black specks	Barely visible	Slightly soiled if not with grease or oil. Dirt in the form of Specks or rings of Light to medium grey	Heavily soiled With grease, oil, dirt spots. Dirt in form of specks or rings of dark grey or black
vi)	Formation	Well-built, slight bulging, slight ridges, soft noses, good tail	Fairly-built, heavy bulging, medium ridges, medium soft broken tail noses, slightly bruised	Poorly-built, heavy ridges, extremely soft noses, no tail or broken tail

Table 1 (*Concluded*)

Sl No.	Characteristic	Grade		
		1	**2**	**3**
(1)	(2)	(3)	(4)	(5)
vii)	Cross ends and loops	Permissible on face but not at the back	Permissible on face but not at the back	Permissible on both face and back
viii)	Tex (or dinear), allowable variation, specified value, percent			
	a) Above 8.4 tex (or 75 d)	Up to ± 4	Up to ± 4	± 4 to 10
	b) 8.4 tex (or 75 d) or below	Up to ± 6	Up to ± 6	± 6 to 12
ix)	Number of filaments			
	a) For filament denier 3 and above	As specified	One filament less than the specified value	Two filament less than the specified value
	b) For filament denier less than 3	As specified	Two filament less than the specified value	Three filament less than the specified value
x)	Milkiness			
	a) Bright yarn	Very slightly milky	Slightly milky	Milky
	b) Dull yarn	Very slighly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
xi)	Sulphur	Trace	Trace	More than trace
xii)	Tenacity, g/tex (or g/d)	*Not less than*		*Below*
	a) Viscose rayon yarn			
	Bright	14.4 (or 1.6)	12.6 to 14.4 (or 1.4 to 1.6)	12.6 (or 1.4)
	Dull	13.5 (or 1.5)	11.7 to 13.5 (or 1.3 to 1.5)	11.7 (or 1.3)
	b) Acetate yarn			
	Bright	9.0 (or 1.0)	8.1 to 9.0 (or 0.9 to 1.0)	8.1 (or 0.9)
	Dull	8.1 (or 0.9)	7.2 to 8.1 (or 0.8 to 0.9)	7.2 (or 0.8)
xiii)	Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xiv)	Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value, for the lot and ± 15 percent for each cone.		
xv)	Directions of twist	‘S’ or ‘Z’ twist	S’ or ‘Z’ twist	S’ or ‘Z’ twist

[1] Grade of yarn should not be lowered only because of its lower rating in appearance.

Table 2 Classification of Yarn in Cakes

(*Clause* 6.1 *and* 9.4.2)

Sl No.	**Characteristic**	**Grade**		
		1	**2**	**3**
(1)	(2)	(3)	(4)	(5)
i)	Tolerance for commercial mass of the lot, percentage of the mass specified by the manufacturer	Up to ± 5	± 5 to 10	± 10 to 15
ii)	Appearance (colour)[1]	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Black specks	Barely visible	Slightly soiled if not with grease or oil. Dirt in the form of Specks or rings of Light to medium grey	Heavily soiled With grease, oil, dirt spots. Dirt in form of specks or rings of dark grey or black
iv)	Formation	Good formation, no laps, no curliness, no cross ends, slightly high or low	Good formation, single lap, no curliness, no cross ends, slightly high or low	Multiple lap, slightly curly or slight blowouts
v)	Tex (or dinear), allowable variation, specified value, percent			
	a) Above 8.4 tex (or 75 d)	Up to ± 4	Up to ± 4	± 4 to 10
	b) 8.4 tex (or 75 d) or below	Up to ± 6	Up to ± 6	± 6 to 12
vi)	Number of filaments			
	a) For filament denier 3 and above	As specified	One filament less than the specified value	Two filament less than the specified value
	b) For filament denier less than 3	As specified	Two filament less than the specified value	Three filament less than the specified value
vii)	Milkiness			
	a) Bright yarn	Very slightly milky	Slightly milky	Milky
	b) Dull yarn	Very slighly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
viii)	Sulphur	Trace	Trace	More than trace
ix)	Tenacity, g/tex (or g/d)	*Not less than*		*Below*
	a) Viscose rayon yarn			
	Bright	14.4 (or 1.6)	12.6 to 14.4 (or 1.4 to 1.6)	12.6 (or 1.4)
	Dull	13.5 (or 1.5)	11.7 to 13.5 (or 1.3 to 1.5)	11.7 (or 1.3)
	b) Acetate yarn			
	Bright	9.0 (or 1.0)	8.1 to 9.0 (or 0.9 to 1.0)	8.1 (or 0.9)
	Dull	8.1 (or 0.9)	7.2 to 8.1 (or 0.8 to 0.9)	7.2 (or 0.8)
x)	Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xi)	Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value, for the lot and ± 15 percent for each cone.		
xii)	Directions of twist	'S' or 'Z' twist	S' or 'Z' twist	S' or 'Z' twist

[1] Grade of yarn should not be lowered only because of its lower rating in appearance.

Table 3 Classification of Yarn in Cheeses

(*Clause* 6.1 *and* 9.4.2)

Sl No.	Characteristic	Grade		
		1	**2**	**3**
(1)	(2)	(3)	(4)	(5)
i)	Tolerance for commercial mass of the lot, percentage of the mass specified by the manufacturer	Up to ± 5	± 5 to 10	± 10 to 15
ii)	Appearance (colour) [1]	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Number of knots in a 0.5 kg cheese (on face only):			
		Not more than	*Not more than*	*Not more than*
	a) Viscose rayon yarn			
	40 d	9	12	15
	60 d	6	9	11
	75 d	5	7	10
	100 d	4	6	8
	120 d	4	6	7
	150 d	3	5	6
	300 d and above	3	6	12
	b) Acetate yarn	3	6	12
iv)	Black specks	Barely visible	Slightly soiled if not with grease or oil. Dirt in the form of Specks or rings of Light to medium grey	Heavily soiled With grease, oil, dirt spots. Dirt in form of specks or rings of or black dark grey
v)	Tex (or dinear), allowable variation, specified value, percent			
	a) Above 8.4 tex (or 75 d)	Up to ± 4	Up to ± 4	± 4 to 10
	b) 8.4 tex (or 75 d) or below	Up to ± 6	Up to ± 6	± 6 to 12
vi)	Number of filaments			
	a) For filament denier 3 and above	As specified	One filament less than the specified value	Two filament less than the specified value
	b) For filament denier less than 3	As specified	Two filament less than the specified value	Three filament less than the specified value
vii)	Milkiness			
	a) Bright yarn	Very slightly milky	Slightly milky	Milky
	b) Dull yarn	Very slighly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
viii)	Sulphur	Trace	Trace	More than trace
ix)	Tenacity, g/tex (or g/d)	*Not less than*		*Below*
	a) Viscose rayon yarn			
	Bright	14.4 (or 1.6)	12.6 to 14.4 (or 1.4 to 1.6)	12.6 (or 1.4)
	Dull	13.5 (or 1.5)	11.7 to 13.5 (or 1.3 to 1.5)	11.7 (or 1.3)
	b) Acetate yarn			
	Bright	9.0 (or 1.0)	8.1 to 9.0 (or 0.9 to 1.0)	8.1 (or 0.9)
	Dull	8.1 (or 0.9)	7.2 to 8.1 (or 0.8 to 0.9)	7.2 (or 0.8)
x)	Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven

Table 3 (*Concluded*)

Sl No.	Characteristic	Grade 1	Grade 2	Grade 3
(1)	(2)	(3)	(4)	(5)
xi)	Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value, for the lot and ± 15 percent for each cone.		
xii)	Directions of twist	'S' or 'Z' twist	S' or 'Z' twist	S' or 'Z' twist

[1] Grade of yarn should not be lowered only because of its lower rating in appearance.

Table 4 Classification of Yarn in Pirns

(*Clause* 6.1 *and* 9.4.2)

Sl No.	Characteristic	Grade 1	Grade 2	Grade 3
(1)	(2)	(3)	(4)	(5)
i)	Tolerance for commercial mass of the lot, percentage of the mass specified by the manufacturer	Up to ± 5	Upto ± 5	± 5 to 10
ii)	Appearance (colour)[1]	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Black specks	Barely visible	Slightly soiled if not with grease or oil. Dirt in the form of Specks or rings of Light to medium grey	Heavily soiled With grease, oil, dirt spots. Dirt in form of specks or rings of dark grey or black
iv)	Formation	Well-built, traverse as required, tight nose, started at correct place, knots on outside of traverse	Fairly-built, some ridges and slight variation in starting place	poorly-built, soft
v)	Tex (or dinear), allowable variation, specified value, percent			
	a) Above 8.4 tex (or 75 d)	Up to ± 4	Up to ± 4	± 4 to 10
	b) 8.4 tex (or 75 d) or below	Up to ± 6	Up to ± 6	± 6 to 12
vi)	Number of filaments			
	a) For filament denier 3 and above	As specified	One filament less than the specified value	Two filament less than the specified value
	b) For filament denier less than 3	As specified	Two filament less than the specified value	Three filament less than the specified value
vii)	Milkiness			
	a) Bright yarn	Very slightly milky	Slightly milky	Milky
	b) Dull yarn	Very slighly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
viii)	Sulphur	Trace	Trace	More than trace
ix)	Tenacity, g/tex (or g/d)	*Not less than*		*Below*
	a) Viscose rayon yarn			
	Bright	14.4 (or 1.6)	12.6 to 14.4 (or 1.4 to 1.6)	12.6 (or 1.4)
	Dull	13.5 (or 1.5)	11.7 to 13.5 (or 1.3 to 1.5)	11.7 (or 1.3)
	b) Acetate yarn			
	Bright	9.0 (or 1.0)	8.1 to 9.0 (or 0.9 to 1.0)	8.1 (or 0.9)
	Dull	8.1 (or 0.9)	7.2 to 8.1 (or 0.8 to 0.9)	7.2 (or 0.8)

Table 4 (*Concluded*)

Sl No.	Characteristic	Grade		
		1	2	3
(1)	(2)	(3)	(4)	(5)
x)	Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xi)	Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value, for the lot and ± 15 percent for each cone.		
xii)	Directions of twist	‘S’ or ‘Z’ twist	S’ or ‘Z’ twist	S’ or ‘Z’ twist

[1] Grade of yarn should not be lowered only because of its lower rating in appearance.

Table 5 Classification of Yarn in Hanks

(*Clause* 6.1 *and* 9.4.2)

Sl No.	Characteristic	Grade		
		1	2	3
(1)	(2)	(3)	(4)	(5)
i)	Tolerance for commercial mass of the lot, percentage of the mass specified by the manufacturer	Up to ± 5	Up to ± 5	± 5 to 8
ii)	Appearance (colour) [1]	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Tex (or dinear), allowable variation, specified value, percent			
	a) Above 8.4 tex (or 75 d)	Up to ± 4	Up to ± 4	± 4 to 10
	b) 8.4 tex (or 75 d) or below	Up to ± 6	Up to ± 6	± 6 to 12
iv)	Number of filaments			
	a) For filament denier 3 and above	As specified	One filament less than the specified value	Two filament less than the specified value
	b) For filament denier less than 3	As specified	Two filament less than the specified value	Three filament less than the specified value
v)	Milkiness			
	a) Bright yarn	Very slightly milky	Slightly milky	Milky
	b) Dull yarn	Very slighly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
vi)	Sulphur	Trace	Trace	More than trace
vii)	Tenacity, g/tex (or g/d)	*Not less than*		*Below*
	a) Viscose rayon yarn			
	Bright	14.4 (or 1.6)	12.6 to 14.4 (or 1.4 to 1.6)	12.6 (or 1.4)
	Dull	13.5 (or 1.5)	11.7 to 13.5 (or 1.3 to 1.5)	11.7 (or 1.3)
	b) Acetate yarn			
	Bright	9.0 (or 1.0)	8.1 to 9.0 (or 0.9 to 1.0)	8.1 (or 0.9)
	Dull	8.1 (or 0.9)	7.2 to 8.1 (or 0.8 to 0.9)	7.2 (or 0.8)
viii)	Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
ix)	Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value, for the lot and ± 15 percent for each cone.		
x)	Directions of twist	‘S’ or ‘Z’ twist	S’ or ‘Z’ twist	S’ or ‘Z’ twist

[1] Grade of yarn should not be lowered only because of its lower rating in appearance.

7 PACKING

7.1 Inland Packing — The material shall be packed in accordance with the provisions laid down in Section 2 of IS 2195.

7.2 Seaworthy Packing — The material for export shall be packed so as to ensure seaworthiness.

8 MARKING

8.1 Each lot of the material graded shall be designated by its grade, namely, Grade 1 or Grade 2 or Grade 3, which shall be suitably marked on a red label affixed on each cone, cake and hank bundles and on the case, carton (or bale) containing the material. Cases, cartons (or bales) shall also be neatly stencilled in indelible ink with the following information:

a) Nomenclature of contents including grade;
b) Gross weight;
c) Commercial weight;
d) Name of the manufacturer, initials or trade-mark;
e) Consignee's name and address; and
f) Country of origin.

8.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

9 SAMPLING FOR GRADING

Representative samples of the material for the purpose of testing its various characteristics shall be drawn as given in **9.1** to **9.3**. The conformity of the lot to the requirements of the declared grade shall be determined in accordance with **9.4**.

9.1 Lot

All viscose rayon yarn or acetate yarn of one definite type and grade, despatched, transported and delivered together and packed in one type of container, and all wrappers, supports, etc, being of fairly uniform weight, shall constitute the lot.

9.2 Scale of Sampling

The number of unopened cases, cartons (or bales) in the lot shall be counted and a number of cases, cartons (or bales) shall be selected at random in accordance with the requirements of Table 6.

Table 6 Number of Cases, Cartons (or Bales) to be Selected from a Lot

(*Clause* 9.2)

No. of Cases, Cartons (or Bales) in a Lot	No. of Cases, Cartons (or Bales) to be selected
Up to 2	1
3 to 4	2
5 to 6	3
7 to 24	4
25 to 50	5
More than 50	At least 10 percent

9.2.2 The cases, cartons (or bales) selected as prescribed in Table 2 shall constitute the bulk sample.

9.3 Procedure

9.3.1 Each case, carton (or bale) in the bulk sample shall be weighed, one by one, correct to 1 part in 1 000. Each case, carton (or bale) in the bulk sample shall be opened and emptied and the number of packages in each counted. Each empty case, carton (or bale) shall be weighed correct to 1 part in 1 000.

9.3.2 Out of the packages in each case, carton (or bale) in the bulk sample a number of packages shall be drawn so as to be representative of the case, carton (or wrappers of a bale) and shall be selected two at a time in accordance with the requirements of Table 7 read together with **9.3.3.**

Table 7 Number of Packages to be Selected from a Case, Carton (or Bale)

(*Clause* 9.3.2)

No. of Packages in a Case, Carton (or Bale) in a Lot	No. of Packages to be selected
Up to 25	2
26 to 50	4
51 to 75	6
76 to 100	8
101 to 125	10
More than 125	12

9.3.3 If the yarn is on pirns, the number of packages to be selected shall be doubled.

9.3.4 For each of the cases, cartons (or bales) in the bulk sample, the packages selected shall constitute the reduced sample for that case, carton (or bale) and each reduced sample shall be kept separate so as to identify it with the parent cases, cartons (or bales). All the reduced samples taken together shall constitute the integrated sample.

9.3.5 If the procedure given in **9.3.4** provides less than 10 packages or, in the case of pirns, less than 20 packages from the whole lot, further packages shall be taken from the selected cases, cartons (or bales) to bring the number of packages up to 10 or, in the case of pirns, up to 20.

9.3.6 The integrated sample shall be divided into two parts, an equal number of packages from each case, carton (or bale) being included in each part and the packages selected from each of the reduced samples constituting the integrated sample (*see* **9.3.4**) being kept separate so as to identify it with the parent case, carton (or bale). One part shall be utilized for determination of commercial weight, and the other for determination of the remaining characteristics.

9.4 Criteria for Conformity

9.4.1 The lot shall be considered as conforming to the requirements of the particular grade if the conditions mentioned under **9.4.2** to **9.4.5** are all satisfied.

9.4.2 *Commercial Weight* — The commercial weight of the lot as determined under **5.1.1** shall be within the applicable tolerances as given in the appropriate Tables 1 to 5.

9.4.3 *Tex (or Denier) and Tenacity* — The number of packages failing to satisfy the requirements of any of these characteristics shall not exceed the acceptance number as given below:

Sample Size	*Acceptance Number*
5 to 35	1
36 to 85	2
86 to 100	3

9.4.4 *Knots, Filaments, Length of Skein and Dyeing Characteristics* — The number of packages failing to satisfy the requirements of any of these characteristics shall not exceed the acceptance number as given below:

Sample Size	*Acceptance Number*
5 to 9	1
10 to 21	2
22 to 35	3
36 to 50	4
51 to 66	5
67 to 83	6
84 to 100	7

9.4.5 *Other Characteristics* — The number of packages failing to satisfy the requirements of any of the remaining characteristics shall not exceed the acceptance number as given below:

Sample Size	*Acceptance Number*
5 to 8	2
9 to 14	3
15 to 20	4
21 to 26	5
27 to 33	6
34 to 40	7
41 to 47	8
48 to 55	9
56 to 62	10
63 to 70	11
71 to 78	12
79 to 85	13
86 to 93	14
94 to 100	15

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
232 : 2020	Glossary of textile terms — Natural fibres (*third revision*)
1324 : 1966	Glossary of textile terms relating to man-made fibre and fabric industry (*first revision*) (Superseding IS 1325 : 1958)
832 (Part 1) : 2011/ ISO 2061 : 1995	Textiles — Determination of twist in yarns: Part 1 Direct counting method (*second revision*)
2195 : 1964	Code for inland packaging of man-made fibre fabrics and man-made fibre yarns
4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)
7703 (Part 1) : 1990	Methods of test for man-made fibres continuous filament flat yarn: Part 1 Linear density (*first revision*) (superseding IS 1226 : 1957)
7703 (Part 2) : 1990	Methods of test for man-made fibres continuous filament flat yarn: Part 2 Dry and wet tenacity and elongation (*first revision*) (superseding IS 1228 : 1957)
7703 (Part 3) : 1991	Methods of test for man-made fibre continuous filament flat yarn: Part 3 Commercial mass (*first revision*) (superseding IS 1229 : 1957)

ANNEX B

(*Clauses* 5.1.4 *and* 5.1.8)

METHODS OF TEST

B-1 FILAMENTS

B-1.1 Test Specimen

For the purpose of this test, the packages drawn from the lot as in **9.3.6** shall constitute the test specimens.

B-1.2 Apparatus

A twist tester, normally used for determining the twist of continuous filament rayon and acetate yarn, shall be used for the purpose of this test.

B-1.3 Procedure

Set the sliding clamp of the twist tester 25 cm away from the rotating clamp. If the yarn is in the form of hanks, mount the hanks on the reel. Draw approximately 10 cm of yarn from the front of the reel (if the yarn is in the form of hanks) or from the side of the package (if the yarn is in the form of packages other than hanks) as the reel or the package rotates on its axis and lead the yarn to the twist tester.

B-1.3.1 Leaving the length drawn as a free tail near the rotating clamp of the twist tester, mount in its clamps a test length from beyond the length drawn. Cut off the free tail but do not severe the test length from the reel or the package. Revolve the rotating clamp to untwist the yarn until it is possible to pass a needle from one clamp to the other between the untwisted individual filaments of the test length examining it visually or through a magnifying glass, if necessary. Count the number of the individual filaments. Then cut off the sample mounted on the twist tester.

B-1.3.2 Draw approximately 2 m of yarn from the front of the reel or from the side of the package as the reel or the package rotates on its axis and lead it to the tester. Determine in the manner prescribed in **B-1.3.1** the number of individual filaments of another test length from beyond the length drawn.

B-1.3.3 Determine in the manner prescribed in **B-1.3.2** the number of individual filaments on three other test lengths.

B-1.3.4 Draw off approximately 100 m of yarn from the front of the reel or from the side of the package as the reel or the package rotates on its axis and lead it to the tester. Determine in the manner prescribed in **B-1.3.1** the number of individual filaments of a test length from beyond the length drawn.

B-1.3.5 Determine in the manner prescribed in **B-1.3.2** the number of individual filaments on four test lengths.

B-1.3.6 Calculate the mean of the 10 values for the number of individual filaments for the package and report this as the number of individual filaments in the package under test.

B-1.3.7 Similarly determine the mean number of individual filaments for each of the remaining packages in the test specimen.

B-2 SULPHUR CONTENT

B-2.1 Test Sample

For the purpose of this test, samples of the packages drawn from the lot as in **9.3.6** shall constitute the test sample.

B-2.2 Test Specimen

Cut the sample under test into small strips of approximately 25 mm in length. Mix the pieces thoroughly. From the pieces so mixed, draw at least two specimens each of the following size:

Non-desulphurized sample 2 to 4 g

Desulphurized sample 20 to 40 g

B-2.3 Conditioning of Test Sample

The test sample shall be conditioned prior to evaluation in a standard atmosphere of 65 ± 2 percent RH and 27° ± 2 °C temperature for 24 h.

B-2.4 Reagents

B-2.4.1 *Caustic Soda Solution* — 1 percent.

B-2.4.2 *Sodium Hypobromide* (NaOBr) *Solution* — Prepared by adding bromine to cold sodium hydroxide solution. The resulting solution should be alkaline.

B-2.4.3 *Hydrochloric Acid Solution* — 1 : 1.

B-2.4.4 *Barium Chloride Solulion* — 2 percent.

B-2.4.5 *Silver Nitrate Solution* — 2 percent.

B-2.5 Procedure

B-2.5.1 Take one test specimen as conditioned and determine its weight correct to the nearest milligram. Extract from it sulphur and sulphur compounds present therein, in the following manner.

B-2.5.2 Take the test specimen in about 250 ml of caustic soda solution in a beaker, cover it with a watch-glass to minimize losses due to evaporation and boil for an hour in a constant level water-bath (*see* Note), the level of the liquid in the beaker constant by adding hot distilled water from time to time.

NOTE — The level of the liquid in the beaker should be below the level of water in the bath.

B-2.5.3 At the end of an hour of boiling, decant the extract. Wash the extracted specimen with distilled water. Add the washings to the extract.

B-2.5.4 Repeat the procedure prescribed in **B-2.5.2** and **B-2.5.3** on the same specimen two more times, extracting with 200 and 150 ml of caustic soda solution respectively.

B-2.5.5 Collect all extracts and washings and concentrate the resulting solution to a volume of 150 to 200 ml.

B-2.5.6 Oxidize the sulphur in the solution with the addition of about 25 ml of sodium hypobromide solution. Keep the solution for about 15 minutes and then boil it. Liberate the excess of bromine by making the solution acidic with the addition of hydrochloric acid solution. After the completion of the evaluation of bromine, filter the solution and wash the precipitate. Collect the filtrate and the washings and concentrate them to 100 to 150 ml. Add barium chloride solution to precipitate the sulphate as barium sulphate. Digest the precipitate and allow it to settle overnight. Filter it with an ashless filter paper, wash till free from chloride (*see* Note) and dry. Incinerate the residue with the filter paper to constant weight and determine its weight accurately.

NOTE — Small portion of filtrate should be tested with silver nitrate solution for the absence of chloride.

B-2.5.7 Determine separately the moisture content, percent, in the material under test.

B-2.6 Calculation

B-2.6.1 From **B-2.5.1** and **B-2.5.7,** determine the dry weight of the specimen under test.

B-2.6.2 Determine the sulphur content (as barium sulphate), percent of the specimen by the following formula:

Total sulphur (as barium sulphate), percent by weight, present in the specimen =

$$\frac{W_1}{W}\times 100$$

where

W_1 = weight of the residue (*see* **B-2.5.6**), and

W = dry weight of the specimen (*see* **B-2.6.1**).

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Man-Made Fibres, Cotton and their Products Sectional Committee, TXD 31

Organization	*Representative(s)*
ICAR-Central Institute for Research on Cotton Technology, Mumbai	Dr P. K. Mandhyan (***Chairman***) Dr A. Arputharaj (*Alternate*)
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Association of Synthetic Fibre Industries New Delhi	Shri M. S. Verma
Bidhata Industries Pvt Ltd, Mumbai	Shri R. K. Pacheriwala Shri Rohit Pacheriwala (*Alternate*)
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Scientist 'F' and Head (Textiles), BIS

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